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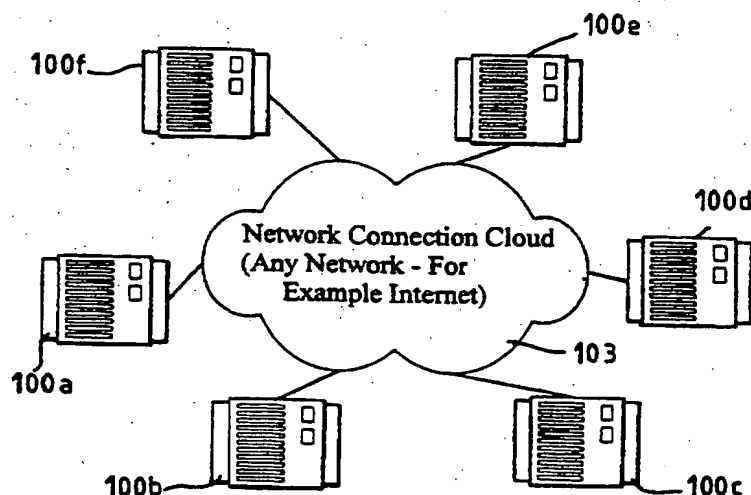
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(54) Abstract Title
A unified messaging system

(57) A unified messaging system, comprising a plurality of nodes (100a - 100f) and network means (103) for interconnecting said plurality of nodes for distributed operation, each node comprising means for receiving, storing and transmitting data, characterized in that an In-box having a predetermined logical location is reserved for each user, and data intended for a particular user is stored at the node at which it is received together with information indicating the logical location of the In-box of the user for which the data is intended, wherein the system is arranged such that said data can be retrieved at one or more other nodes in the system and such that all data bearing said predetermined logical location information is accessed when said user's In-box is accessed. The messages can be voicemail, fax and e-mail etc. The nodes are preferably interconnected by means of a Internet-based network.

**Fig. 2**

A unified messaging system

The present invention relates to a unified messaging system.

A unified messaging system is defined as a system whereby all messages, for example voicemail, fax and e-mail etc, are presented within one central In-Box location. These can be collected via various means and converted to the most appropriate format specified by the collector.

Existing unified messaging systems are singular systems which interface with a telephone switchboard and work as a single entity.

Such a system has evolved from PABX and telephone switchboard systems. The unified messaging components are added to the switchboard typically in a separate computer system. Telephone calls are initiated on telephone network, then pass through the switchboard PABX. From there calls are transferred to the computer system running the unified messaging system. An example of such a conventional system is shown in Fig. 1.

The system comprises a PBX/PABX unit 3 and a separate computer system 5. The PBX/PABX unit 3 is connected to the external telephone line 7 via the PSTN, public telephone network, and to the computer systems 5 via an internal connection 9. The computer system 5 has a network connection 11 for distribution of messages, for example e-mail. On a functional level the above system operates as a single entity, i.e. there are no other distributed nodes to communicate with, the functionality, load processing, databases are concentrated on one system. It may be connected via the

(SMS) message, notification message, system message, video-mail message, white board message.

The system is preferably arranged to provide a menu indicating data bearing the predetermined logical location information when a user's respective In-box is accessed. The menu may, for example, be a voice menu or it may be displayed on a screen in a textual format.

The system may be arranged such that data is retrieved from a first node and transmitted to a second node when said first node receives a signal from said second node upon instructions from a user. Additionally or alternatively, the system may be arranged such that data is transmitted from a first node to a second node at a predetermined time set by the system.

The nodes are preferably interconnected by means of an Internet-based network.

At least one of the plurality of nodes may comprise means for diverting incoming data to another one of the plurality of nodes, and such means may be automatic (i.e. activated when one of the nodes is busy) and/or user-activated (i.e. when, for example, the user travels).

In providing the unified messaging in a node-based distributed system, the unified message system can be built from an Internet type environment in which telephone components can be seamlessly integrated as just another form of data. The present invention allows for a rich feature set of distributed commands throughout the system. It is the node-to-node distribution of intelligence which is one of the primary significant features of the present invention.

The following table highlights the main differences and advantages of the present invention over the unified messaging system described with reference to Figure 1:

Figure 1 is a schematic diagram of a conventional unified messaging system;

Figure 2 is a schematic diagram of the unified message system according to the present invention; and

Figure 3 illustrates a single node of the system of Figure 2.

The system of the present invention is built from an Internet perspective and comprises an Internet centric distributed connection which mirrors the resilient and distributed nature of the design of the Internet. The system integrates telephone components seamlessly as just another form of data. This is possible due to the recent advances in computer telephony hardware which allow for phone calls to terminate in computer systems.

The unified messaging system of the present invention is a distributed system comprising a plurality of nodes 100a-f each naming data input/output connected together via the network 103 such that each node is functionally part of a larger system. Its functionality is performed on the multiple of nodes. The network communication between the nodes is not purely external communication such as e-mail or message passing such as in the lower levels of the traditional unified messaging system. The network communication is at all levels of the OSI model. For example network communication is not confined to external communications, it is the actual internal system communication working in all 7 layers of the OSI model. The OSI 7 Layer Protocol model is a standard mechanism for describing technical network and computer systems. It is ratified by the International Standards Organisation. This Protocol is well known to persons skilled in the art and will not be described in detail here, but in brief it describes a common reference model of categorising components of a system. Such a reference point is useful in describing the functionality of the unified messaging system of the present invention.

Collecting Messages: The methods by which messages are retrieved from the central In-Box.

Sending Messages: The methods by which the user can send their own messages. This can be in the form of a reply to an incoming message or the initiation of a new message for sending.

Message Broadcasting: This functionality which lets the user broadcast the same message to a list of users.

Telecommunications Functionality: Those features which let conference phone calls take place and allow for live telephone calls to be routed.

Intelligent Agents: Components whose function is to control the routing, timing, priority and delivery of the above constructs.

The user can receive messages via any of the nodes of the unified messaging system of the present invention by voicemail message, fax message, e-mail message, web response message, phone answering message, SMS and other wireless "short message service" based message, notification message, system message, video-mail message and white board message.

Once the messages are received they are stored in the users In-Box. The In-Box to the user has one central location, i.e. one location logically. The Actual In-Box has the messages and components spread over the distributed node based system, physically distributed.

The types of incoming messages which can potentially be supported by the system of the present invention are detailed below.

then sent by the bureau into the node over for example an Internet link and stored as text messages in the In-Box.

SMS messages are sent via mobile/cellular phones and other wireless devices. These messages are typically short and are stored as text messages in the In-Box.

Notification messages are not received from external sources but are internally generated by the system. These are created if a rule set in the intelligent agent is activated to notify a user if a message of any type is left. Notification messages are stored in the In-Box as text messages.

System messages are not received from external sources but are internally generated by the system. They are created when the user has to be informed of a system event, for example "message box full" or "system will be down from 5am-5.30am". System messages are stored in the In-Box as text messages.

Video-mail messages are similar to voicemail messages except that they play video and sound clips instead of sound clips only. Messages are received on the node via a unique identifier address which identifies them for the particular user. Messages are stored as video-mail messages in the In-Box, and example standard of storage is MPEG or AVI.

White board messages are free form diagrams which a user program is able to create from a support white board software package using familiar software graphics manipulation tools such as pencil, fill and paint. The messages are snapshots in time from when they were sent. White board messages are received on the node via a unique identifier address which identifies them for the particular user and are stored as images in the In-Box for example TIFF or JPEG formats.

Once the user has received one or more the messages described in the above section they are deposited in the users In-Box. They must now be collected. There are two categories of message collection - Push and Pull. A Push collection method involves

- voicemail, the voicemail recording file simply played by the browser through the speakers attached to the Internet terminal device. The file is typically in WAV or Real Audio format;
- e-mail, the text is simply displayed on the screen;
- fax, the graphic representation of the message is simply displayed on the screen of the Internet device. This is typically in JPG or TIFF format;
- phone answering messages, the text is simply displayed on the screen;
- web response messages, the ext is simply displayed on the screen;
- SMS and wireless messages, the text is simply displayed on the screen;
- notification messages, the text is simply displayed on the screen;
- system messages, the text is simply displayed on the screen;
- video-mail, the video-mail recording file simply played by the browser through the screen and speakers attached to the Internet terminal device. The file is typically in MPG or AVI format; and
- white board message, the graphics representation of the message is simply displayed on the screen of the Internet device. This is typically in JPG or TIFF format.

Messages can be collected by a client specific program. This piece of software must be installed on a computer or PDA/Hand-held organizer system, for example Windows, Unix, Macintosh, Windows Ce, Palm Pilot, Psion, WAP, HDML compliant device. To access the node the client computer must be connected to the node over a network, for example the Internet. The client program then communicates over the network, typically TCP/IP protocol with any node to retrieve messages. Once authenticated the user is presented with a view of their In-Box in graphical form. The way in which this differs from that of traditional systems is that the user is presented with a centralised common view of their In-Box, a logical view, although the individual messages can be physically located on **any node** in the network. All message types can be retrieved over the Web Site collection method as listed above.

- phone answering messages, the text of the message is included in the e-mail;
- web response messages, the text of the message is included in the e-mail;
- SMS and wireless messages, the text of the message is included in the e-mail;
- notification messages, the text of the message is included in the e-mail;
- system messages, the text of the message is included in the e-mail;
- video-mail, the graphics representation of the message is attached to the e-mail. This is typically in AVI or MPEG format. This can be read by the machine reading the e-mail with an in-built or external viewer; and
- white board message, the graphics representation of the message is attached to the e-mail. This is typically in JPG or TIFF format. This can be read by the machine reading the e-mail with an in-built or external viewer.

Messages can be collected by being sent to the user's pager or text descriptive mail receiving system. Pager messages are sent out according to the rule set currently set in the intelligent agent. Pager type messages can be sent from any of the nodes. The types of messages which can be retrieved by being sent out via pager are short text message types such as:

- e-mail, the text is contained within the Pager message;
- phone answering messages, the text is contained within the Pager message;
- web response messages, the text is contained within the Pager message;
- SMS and wireless messages, the text is contained within the Pager message;
- notification messages, the text is contained within the Pager message; and
- system messages, the text is contained within the Pager message.

E-mail collection and pager or wireless short message system collection methods are examples of push collection methods.

As well as dealing with the sending and receiving of messages, the unified messaging system of the present invention, the user can also initiate the sending of their own messages via the system. These messages can be constructed from scratch or they can

mechanisms of the nodes and then delivered via an external gateway on one of the nodes. The gateway is able to send the message out to an external communication method, for example Internet e-mail, public telephone system, to a fax machine, to a video device.

Another form of functionality is that of broadcasting messages. This is similar to sending messages except that instead of the message being sent to one recipient it is sent to many. The same input and sending methods are used above except when the message is constructed they are sent to a list of users. This list of users can be maintained in the address book described below.

Some extra functionality built into the system but not part of the core functionality is the telecommunications functions. These are as follows.

One of the functions of the unified messaging system of the present invention is the ability to initiate a conference call from one of the user interfaces described above via telephone, web client or program client. The user enters in both the number of the telephone they are closest to and the telephone numbers of the other members of the conference. This conference request is then passed to one node. The node then makes standard out going telephone calls to all conference parties. Once all have answered then the node patches all calls together. These calls are made over the standard PSTN telephone network.

A "follow me" function can also be built into each node. As described above, each user is allocated a unique telephone number, which is provided over a telephone line which terminates onto the telephone connection port of a node. This number is used to receive voicemail, faxes or can be diverted to a live telephone answering bureau. Another option is that any call coming into that line can be diverted any other telephone number. This forms a re-routably number. For example a user could have a number 345 6789 which terminates and rings on a node. When this number rings the node is programmed

Move Message to In-Box - Folder "Joe"	special folder called Joe
On Sending the Message If Message Priority is "High" & Message Type is "E-mail" Send Message to Push Sender Pager	Sends all high priority E-mails to a pager as well as the default E-mail. If no pager address for that user exists in the message of course does not get sent

Therefore, unlike traditional unified messaging systems, the messaging system of the present invention does not work a single system but comprises a plurality of nodes which work together in a distributed system. Network connections are used to input and output messages as on the traditional system as well as performing distributed operation and inter-nodal control. The traditional unified messaging system requires connection to a telephone switchboard or PABX for the input and output of the telephone-based messages. In the system of the present invention the telephone connection is made directly into the node without any external telecommunication based equipment being required. The system of the present invention can provide a remote integrated message larning option. This remote node receives a message in a different location to the user, allowing for a "virtual branen office" which is a telephone number which can receive faxes, voicemail etc in a totally remote city. For example, the user is based in London and has a virtual branch office in Hong Kong. Calleps in Hong Kong contact the user via the local Hong Kong telephone number instead of making an international call. The message then enters the common unified messaging system to be access by the user in London. Such a remote message leaving option would not be possible on the traditional system.

The user can also access any message from any node since the node work together as one system. This can be achieved with the same interface. For example a user uses a London based node. While away in Los Angeles, say, the user can call a Los Angeles based node at local call rate to retrieve all his messages.

Typically, the traditional system can integrate voicemail, fax and e-mail message type. However, the messaging system of the present invention can integrate a variety of

- DTMF/MF

Voice Support:

- WAV, VOX, GSM

Video Support:

- MPEG
- AVI
- H323

Module:

- Keyboard and Monitor Ports

Operating Environment:

- Operating Temperature: 0 to 45⁰C, internal ambient
- Storage temperature: - 10 to 70⁰C

Regulatory Compliance:

- PUL/UL Canada
- UK Ofel
- FCC Certified Class A

The present invention has been described above purely by way of example, and modifications can be made within the spirit of the invention. The invention also consists in any individual features described or implicit herein or shown or implicit in the drawings or any combination of such features or any generalisation of any such features or combination.

7. A messaging system according to claim 6, wherein said menu is a voice menu.
8. A messaging system according to claim 6, wherein said menu is displayed on a screen.
9. A messaging system according to claim 2, wherein at least one of said plurality of nodes includes means for converting text data into speech data.
10. A messaging system according to claim 2, wherein at least one of said plurality of nodes includes character recognition means.
11. A messaging system according to any preceding claim, arranged such that data is retrieved from a first node and transmitted to a second node when said first node receives a signal from said second node.
12. A messaging system according to any preceding claim, arranged such that data is transmitted from a first node to a second node at a predetermined time set by the system.
13. A messaging system according to any one of the preceding claims, wherein said nodes are interconnected by means of an Internet-based network.
14. A messaging system according to any one of the preceding claims, wherein at least one of said plurality of nodes comprises means for diverting incoming data to another one of said plurality of nodes.
15. A messaging system according to any one of the preceding claims, wherein at least one of said plurality of nodes comprises user-activated means for diverting incoming data to another one of said plurality of nodes.



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Claims searched: 1-16

Examiner: Richard Howe
Date of search: 25 November 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.P): H4K (KF50C, KF50X)

Int CI (Ed.6): H04M (3/50)

Other: Online : wpi

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0 820 181 A2 (AT&T) - see whole document	1,3,5,11, 14
X	EP 0 760 573 A2 (AT&T) - see whole document	1,3,5,11, 14
X	EP 0 560 111 A2 (ROLM) - see whole document	1,3,5,11, 14

X Document indicating lack of novelty or inventive step
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A Document indicating technological background and/or state of the art.
P Document published on or after the declared priority date but before the filing date of this invention.

E Patent document published on or after, but with priority date earlier than, the filing date of this application.